

Aguascalientes City [8 ♂, 2 ♀], Yurecuaro [5 ♂] in Michoacan, Jalapa [2 ♂ + 1 pair] (*Calvert, coll. P. P. C.*); GUATEMALA, along small stream on railroad near Guatemala City (*Williamson, coll. ejusd.*: 1 ♂)\*.

### **Enallagma semicirculare** (p. 112).

The Saltillo male has a semicircular black spot on abd. seg. 2, but without a "tail," a transverse isolated antepical black streak on 3, 4-6 as in the Misantla example (*cf. antea*, p. 112).

To the localities given, add:—MEXICO, Saltillo in Coahuila (*Calvert, coll. P. P. C.*: 1 ♂).

This specimen was beaten out of the grass near the railway-tracks.

### **Enallagma cœcum** (p. 112).

Subspecies **novæ-hispaniæ**, subsp. n.

*Enallagma cœcum*, Calvert, *loc. cit. antea*, p. 112 (1895).

Characters as given, *antea*, p. 113, to distinguish the continental examples from the Antillean types.

The following variations in size may be added:—

Abdomen, ♂ 22.5-26, S. Lucia; 23.5-25.5, Mazatenango; 24-25.5, Gualan.

Hind wing, ♂ 15-17, „; 16-17.5, „; 16-17.5, „

To the localities given, *except* those of the West Indies, add:—GUATEMALA, Mazatenango (*Maxon & Hay, U. S. N. M.*: 1 ♂) [9 ♂], Santa Lucia [3 ♂], Santa Maria [2 ♂ + 1 pair], Escuintla [3 ♂, 2 ♀], Amatitlan [3 ♂], Sanarate [3 ♂], Gualan [10 ♂, 1 ♀], Los Amates [3 ♂]; HONDURAS, San Pedro Sula [1 ♂] (*Williamsons, Hine, colls. Wllmsn., O. S. U.*); COSTA RICA, Jesus Maria (*Biolley, A. N. S.*: 1 ♂).

The type of this subspecies is the male from Atoyac cited *antea*, page 113.

### 9. **Enallagma cultellatum**. (Tab. X. figg. 36, 37.)

*Enallagma cultellatum*, Hagen in Selys, Bull. Acad. Belg. (2) xli. p. 524 (1876)<sup>1</sup>; Carpenter, Journ. Inst. Jam. ii. p. 261 (1896)<sup>2</sup>.

♂. Face yellow rather than orange, antehumeral stripe blue rather than "vert orange"<sup>1</sup> in all the present material. A fine black line and median point on the base of the labrum, a still finer black line in the suture between frons and nasus, in the continental specimens. The arms of the black "horseshoe-shaped" spot on abdominal segment 2 reach the base of the segment and so separate the enclosed blue from the blue on the sides of the segment in a number of cases (Belize 1, Livingston 1, P. de S. Felipe 2, Amatitlan 1, Colon 1), this enclosed blue being only one-third as long as the segment in the Belize example, one-half as long in the others mentioned, owing to the widening of the arms of the horseshoe. The transverse basal blue rings on 3-5 or 7 are narrow and mid-dorsally interrupted in the examples from Belize, P. de S. Felipe, Livingston, and Colon; wider and not interrupted in those from Amatitlan and Hayti (except on 3 only, in four Amatitlan specimens).

\* The remark on *E. anna*, Wllmsn., printed in the text, *antea*, p. 112, led to a vigorous correspondence between Mr. Williamson and myself, with the result that I am convinced that *E. anna* is distinct from *E. prævarum*, although closely related thereto. Mr. Williamson, however, holds that *E. civile* is the nearest ally of *E. anna*.

♀ (hitherto unknown). Differs from the male as follows:—Face pale (blue? much faded), three black dots on the nasus, or these confluent so that the nasus is mainly black; hind lobe of prothorax blue, with an arcuate black stripe enclosing a median blue dot on the hind margin; abdominal segment 2 with a wide dorsal black band for its entire length, widened antepically but again narrowed at the apex as it is on 3–5 or 7 also; 3–5 with a metallic-green reflection, except at the rather wide transverse basal blue ring which is present on 3–7, not interrupted mid-dorsally (except on 3 in four of the five examples) in the Amatitlan females, but interrupted on all of these segments in the Belize and Jamaican specimens; 8 blue with a dorsal black band, pointed anteriorly, extending from the hind end of the segment two-thirds' way, or all the way, to the base, even in the examples from Amatitlan; 9 black, blue inferiorly on each side rising toward the dorsum at the apex; 10 black at base, blue at apex; appendages blackish, three-fifths as long as 10; genital valvules yellowish at apex, their "palps" not reaching beyond the level of the apex of the appendages. *No trace of a ventral apical spine on 8 in any of the six specimens at hand.*

Viewed in profile, from the side, the hind prothoracic lobe shows a horizontal ridge projecting from the middle of its posterior surface; the male has a similar projecting ridge.

♂ ♀. Postcubitals, on front wings, 10–8, 9 most frequently; on the hind wings 8–6, 7 most frequently (based on tabulation of 24 ♂, 6 ♀).

*Dimensions.*—Abdomen, ♂ 22–25, ♀ 21.5–22.5; hind wing, ♂ 13.5–16, ♀ 15–16.5 mm.

*Hab.* BRITISH HONDURAS, Belize [1 ♂, 1 ♀]; GUATEMALA, Livingston [2 ♂], Fuerte or Puerto de San Felipe [6 ♂], Amatitlan [19 ♂, 3 ♀] (*Williamson, coll. ejusd.*) (*Hine, O. S. U.*: 6 ♂, 2 ♀); PANAMA, Colon (*Howland, coll. Needham*: 2 ♂).—WEST INDIES, Cuba (*Gundlach*<sup>1</sup>), Portland (*A. N. S.*: 1 ♀) in Jamaica<sup>2</sup>, Hayti (*Uhler, M. C. Z.*: 1 ♂).

The venational characters of this species (*cf. antea*, page 379) would easily cause the female to be mistaken for an *Ischnura*, but this sex may be distinguished from that of any species of that genus known to inhabit this region by comparing the unarmed prothorax, the colour of the eighth abdominal segment, and the size of the abdomen with the Synopsis of Species of *Ischnura*, *antea*, page 123.

## ACANTHAGRION (p. 115).

### *Acanthagrion gracile* (p. 115).

Selys's "variety *quadratum*" is represented by numerous males from the following localities:—Gualan (4), Guatemala City (2), Santa Lucia (1), San José (2), Surubres (12). No blue is present on the apex of abdominal segment 7 in specimens of the same sex from Livingston (1), Puerto Barrios (2), Los Amates (6), Gualan (3), Santa Lucia (1), San José (1), Surubres (6); this condition of segment 7 may consequently occur both in typical *gracile* and in var. *quadratum*. The colours described by de Selys for his "race? *vidua*" are to be seen in 1 ♂ and 3 ♀ from Gualan and 5 ♂ and 1 ♀ from Guatemala City; these colours are surely those of an immature condition, as de Selys himself suggested, and cannot be considered as racial.

Forty males from Gualan, abd. 24.5–27.5, hind wing 15.5–17.5 mm., give the following numbers of postcubitals, front wings: 9 11.25%, 10 72.5%, 11 16.25%; hind wings: 7 2.5%, 8 65%, 9 31.25%, 10 1.25%. Ten males from Surubres, abd. 23.5–27, hind wing 15–16.5 mm., give the following numbers of postcubitals, front wings: 10 75%, 11 25%; hind wings: 8 40%, 9 60%.

To the localities given, add:—GUATEMALA, Livingston [1 ♂], Puerto Barrios [4 ♂], Los Amates [9 ♂, 2 ♀], Gualan [40 ♂, 1 ♀ + 2 pairs], along small stream on railroad near Guatemala City [5 ♂, 1 ♀], Santa Lucia [4 ♂, 1 ♀]; HONDURAS, San

Pedro Sula [1 ♂, 1 ♀] (*Williamson, Deam, Hine, colls. Wllmsn., O. S. U.*); COSTA RICA, San José (*Biolley*: 2 ♂), Surubres (*Biolley, coll. Kahl*: 12 ♂).

Mr. Williamson noted of this species: "Los Amates, Jan. 18. In shaded bogs"; "Gualan, Jan. 14. Occurs in nearly all situations, usually common." Prof. Biolley marked those from Surubres as from "eau stagnante."

### TELEBASIS (p. 115).

#### **Telebasis collopistes** (p. 116).

An additional male from Puerto de San Felipe has abd. seg. 10 red, like 8 and 9; stigma on front wings surmounting less than one cell, on the right hind wing more than one cell (left hind wing broken).

To the localities given, add:—GUATEMALA, Puerto de San Felipe (*Williamson, coll. ejusd.*: 1 ♂).

#### **Telebasis griffinii** (p. 117).

Some of the Guatemalan examples are as large (abd., ♂ 22.5–25, ♀ 26; hind wing, ♂ 15–16.5, ♀ 17 mm.) as the type from Darien, but in none of them are there more than 10 postcubitals on the front wings.

To the localities given, add:—GUATEMALA, Puerto de San Felipe (*Williamson, coll. ejusd.*: 13 ♂, 1 ♀).

#### **Telebasis filiola** (p. 118).

♂. The supplementary males have the fewer postcubitals and the superior black stripe on the femora, as noted *antè*, p. 118; otherwise they agree well with de Selys's description<sup>2</sup>.

♀. The mesostigmal laminae ("tubercules carrés élevés près de l'échancrure mésothoracique" of Hagen's description, printed by de Selys<sup>2</sup>) are well developed to a degree rarely seen in this division of the legion Agrion and strongly remind one of *Argia*. Mesepimeron with a brownish or black stripe, femora with a superior black stripe. Thoracic dorsum and abdomen showing differences in colour, perhaps due to age, as follows:—

The Amatitlan example has the mid-dorsal thoracic dark green reaching only halfway each side from the median carina to the humeral suture, dorsum of abd. segs. 3–7 pale brown.

One female from Puerto de San Felipe has the mid-dorsal thoracic dark metallic green extending on each side from the median carina two-thirds way to the humeral suture, and a small confluent blackish spot on the middle of the pale area thus left immediately anterior to that suture. In the other two from this locality the mid-dorsal thoracic metallic dark green reaches to the humeral suture except for a short superior, and in one also a larger inferior, antehumeral pale stripe. All three have a mid-dorsal stripe on 3–7 darker than the brown on each side, enlarging at the apex of each segment into a round black spot.

The Altamira female has the thoracic dorsum coloured as in the males, viz. entirely dark metallic green to the humeral suture except for a short inferior pale green stripe immediately in front of and bordering the humeral suture; 3–7 almost black except for the basal yellow ring on each segment.

In all the females, as in the males, the mid-dorsal thoracic carina is pale green.

*Dimensions*.—Abdomen, ♂ 17.5, ♀ 17–18; hind wing, ♂ 11.5, ♀ 12–13 mm.

To the localities given, add:—MEXICO, Altamira (*Hoag, coll. P. P. C.*: 1 ♀) in Tamaulipas; GUATEMALA, Puerto de San Felipe [21 ♂, 3 ♀], Morales [1 ♂], Amatitlan

[1 ♂, 1 ♀]; HONDURAS, San Pedro Sula [1 ♂] (*Williamson, Hine, colls. Wllmsn., O. S. U.*).

**Telebasis digiticollis** (p. 118). (Tab. X. figg. 39, 40.)

♂ (hitherto unknown). Upper and hind surfaces of head black or dark metallic green; a short isolated yellow streak between each posterior ocellus and the antenna of the same side and a reddish spot on each side of the anterior ocellus, these sometimes obliterated; frons anteriorly pale (reddish? in life), clypeus reddish, labrum orange or bright red, genæ greenish-yellow, labium cream-coloured.

Prothorax dark metallic-green, anterior edge of the front lobe, a very short oblique streak on each side of the median lobe anteriorly, sides inferiorly, extreme hind edge of hind lobe, yellow.

Thorax pale brownish-yellow superiorly, bluish (?) inferiorly; a mid-dorsal dark metallic-green band whose width extends on each side two-thirds, to all the way from the dark median carina to the humeral suture; in the former case its lateral margin is sinuous and a well-developed pale humeral stripe exists; in the latter case it is confluent inferiorly with a dark metallic-green mesepimeral stripe, which never reaches up to the front wing-base, and the pale humeral stripe is superior only; a short black mark at the upper ends of the humeral and second lateral sutures. Two small metallic-green spots or streaks on the site of the obsolete first lateral suture: one at its upper end, the other, a short distance below, is in one case fused with the upper end of the mesepimeral stripe.

Abdomen bright red, usually unmarked, but one male, with some pruinosity on the underside of head and of thorax, has the following black markings: a pair of small dorsal apical spots on 7, a pair of narrow dorsal stripes on the apical half of 8 and on the greater part of the length of 9, a lateral spot on 9 and on the base of 10. Segment 10 half as long as 9, its apical margin not or barely excised, but elevated in the middle into two small prominences. Superior appendages as long as 10, blackish; in dorsal view, divergent, convex exteriorly, concave interiorly, apex obtusely-pointed; in oblique view from the side and above, the apex is blunt, rounded; in profile view, each appendage is bent strongly downward in its apical two-thirds, apex obtuse. Inferior appendages at least one-and-one-half times as long as the superiors, reddish, tapering to an acute apex, which in profile view is curved slightly upward, in dorsal or ventral view is curved toward the median line.

Hind lobe of prothorax convex, flattened medially, no processes.

Legs yellow, a superior black stripe on the femora.

Pterostigma brown, a pale yellow line immediately within its enclosing veins, surmounting one cell or a little more or less. Postcubitals, front wings 8-11, 10 most frequently; hind wings 6-9, 8 most frequently.

Abdomen 22.5-25.5, hind wing 15-16 mm.

♀. The example from P. Cortez has the abdomen 29, hind wing 19 mm. in length.

To the localities given, add:—GUATEMALA, Puerto Barrios [1 ♀ + 1 pair], Los Amates [13 ♂], Gualan [1 ♀]; HONDURAS, Puerto Cortez [1 ♀] (*Deam, Williamson, Hine, colls. Wllmsn., O. S. U.*).

Mr. Williamson noted of this species: "Los Amates, Jan. 16. ♂. In bog with *Ischnura*" [= *Ceratura capreola*].

The male of this species is very similar to that identified in this work as *T. griffinii*; it differs as follows: prothorax in great part dark metallic-green (chiefly yellowish in *griffinii*), dark metallic-green mesepimeral stripe always present (often absent, shorter when present, in *griffinii*), inferior appendages absolutely—and also relatively with respect to the superiors—longer, superior appendages more strongly curved downward (*cf.* figg. 31, 32, Tab. V., with figg. 39, 40, Tab. X.). These differences make it probable that I have correctly identified *T. griffinii*.

**Telebasis isthmica** (p. 118).

The mid-dorsal thoracic stripe is a little narrower in these supplementary specimens than in the types.

To the localities given, add:—COSTA RICA, Bebedero (*Underwood*: 1 ♂), Santa Clara (*Tristan*: 1 ♂).

**Telebasis salva** (p. 119).

*Erythragrion salvum*, Needham, Proc. U.S. Nat. Mus. xxvi. t. 54. fig. 7 (venation) (1903)<sup>6</sup>.

*Telebasis salva*, Needham, Proc. U.S. Nat. Mus. xxvii. p. 716, fig. 8 (nymphal gill) (1904)<sup>7</sup>.

In one only of the supplementary specimens, a male from Gualan, are the submedian dorsal thoracic bronze stripes hardly widened superiorly, and in it the apex of the projecting angle on each side is still present as an isolated bronze dot. In one male from Jesus Maria these stripes are not at all widened superiorly and there are no vestigial dots.

To the localities given, add:—MEXICO, Baños de Santa Rosalia [2 ♂] in Chihuahua, Yurecuaro [2 ♂] in Michoacan, Ocotlan [2 ♂, 1 ♀] in Jalisco (*Calvert, coll. P. P. C.*), Aguascalientes (*Howard, U. S. N. M.*: 1 ♂); GUATEMALA, Los Amates [4 ♂], Gualan [29 ♂, 1 ♀], Escuintla [1 ♂], Santa Lucia [1 ♂] (*Williamson, Deam, Hine, colls. Wllmsn., O. S. U.*); COSTA RICA, Jesus Maria (*Biolley, colls. A. N. S., Wllmsn.*: 2 ♂, 1 ♀); PANAMA, Colon (*Howland, coll. Needham*: 1 ♂).

This species was very abundant at Ocotlan on August 29, 1906. The eyes of the adult male are bright scarlet in life.

## LEPTOBASIS (p. 120).

**Leptobasis vacillans** (p. 120).

*Leptobasis vacillans*, Baker, Invert. Pacif. i. p. 86 (1905)<sup>3</sup>.

Mr. Williamson noted of a female at Los Amates: "Thoracic colours light sea-green and bright light rust or almost orange." The sea-green appears to include, in some of both sexes, an antehumeral stripe (which has faded in the specimens previously recorded) not reaching to the front wing-bases, its upper end a little widened and cut straight across, and some of the sides of the thorax. The effects of dessication on the thoracic colours are very varied, however.

Of the twenty-five additional females here recorded, all but three (Los Amates) have the vulvar spine present. In those three I am unable to determine whether its absence is due to breakage or not, but they have the abdomen otherwise entire.

To the localities given, add:—GUATEMALA, Morales [3 ♂, 2 ♀], Los Amates [9 ♂, 8 ♀] (*Hine, O. S. U.*) [16 ♂, 14 ♀]; HONDURAS, Puerto Cortez [1 ♂] (*Williamson, coll. ejusd.*); NICARAGUA, Granada<sup>3</sup> (*Baker, coll. P. P. C.*: 1 ♀), Chinandega<sup>3</sup>.

Mr. Williamson noted of this species at Los Amates, Jan. 18, 1905: "In shaded bogs along railroad track below Los Amates. Very slow and sluggish, always in shade and in one certain species of sedge, though a grass very similar in style grew in proximity. Observed between 2 and 5 P.M."

## METALEPTOBASIS, gen. nov.

The study of an additional species for this faunal district and the remarks made under *Leptobasis, antea*, page 120, appear to necessitate the formation of a new genus distinguished from *Leptobasis* by the following characters:—Inferior sector of the triangle arising as far distal to the submedian cross-vein as the latter is long, nodal sector arising at the fifth or sixth postcubital on the hind wings, at the sixth or more remote on the front wings (at the fourth and fifth respectively in *Leptobasis vacillans*), tarsal claws toothless. Superior appendages (♂) and genital valves (♀) otherwise than as in *Leptobasis* (cf. *antea*, pages 101–2).

Type: *M. bovilla*, sp. n.

This genus will also include *L. diceras*, Selys, and perhaps other species associated therewith by de Selys.

1. *Metaleptobasis bovilla*, sp. n. (Tab. VII. figg. 21–23.)

- ♂. Anterior surface of frons, rhinarium, bases of mandibles, under and hind surfaces of head pale (blue in life?); vertex, superior surface of frons, nasus, and labrum black, in part with a metallic-green reflection, a short orange line between each lateral ocellus and the antenna of the same side. First antennal joint blackish, its thickness and length subequal; second joint about one-and-one-half times as long as the first, more slender, pale but darker distally; remaining joints and the labium lost.
- Prothorax lost. Thorax orange, sides paler (pale blue in life?), a metallic-green mid-dorsal stripe, .5 mm. wide, much narrowed at its anterior end to pass between two orange, curved processes (“horns”). Each process is about 1 mm. long, situated behind a mesostigma, directed forward and upward when seen from the right or left side of the insect, subparallel with its fellow of the other side for half its length, then diverging therefrom and curved outward (laterad).
- Abdominal segment 1 pale (blue?) with a dark transverse apical ring; dorsum of 2–10 dark metallic-green, gradually becoming blackish-brown on the posterior segments, a narrow, transverse, basal pale ring, interrupted mid-dorsally; ventral surface of abdomen pale, except at the apices of 3–6, which are darker.
- Superior appendages .5 mm. long, a little shorter than segment 10, in dorsal view curved toward each other, gradually tapering from base to apex; in profile view the apical half much more slender than the basal half and curved strongly downward, apex acute. Inferior appendages nearly three times as long as the superiors; in profile view the basal two-thirds are directed backward and upward, the distal third backward and downward, and forming with the basal part an angle of about 120°, at one-third length of the appendages a small superior tubercle; in ventral view the two appendages are subparallel in their basal halves, curved toward each other in their apical halves, a small angular excision on the inner side of each at half-length, apices moderately acute.
- Legs (fragments only) pale; tarsal claws apparently without a tooth.
- Wings colourless, stigma brown, surmounting exactly one cell, submedian cross-vein at level of two-thirds to three-fourths distance from first to second antecubital, inferior sector of triangle separating from hind margin of wing at a distance beyond the submedian cross-vein subequal to the length of the cross-vein itself, anterior side of quadrilateral half (front wing) or two-thirds (hind wings) as long as the posterior side, three antenodal cells, twelve postcubitals on front and hind wings (right front wing lost), nodal sector arising at the sixth, ultra-nodal at the tenth postcubital, upper sector of triangle ending at level of ninth, lower sector at level of sixth postcubital.
- ♀. Differs from the male as follows:—Labrum brownish-yellow, free margin narrowly darker brown, line between ocellus and antenna yellow, second antennal joint subequal in length to the first, third joint twice as long, pale, darker at apex, remaining joints hair-like, black; prothorax pale obscure luteous, hind margin convex, slightly produced medially; mid-dorsal thoracic stripe metallic-blue, mesothoracic

“horns” in same position as those of the male, conical, much shorter and apparently broken off apically; abdominal segments 1-7 dark metallic-blue on dorsum, sides inferiorly and a basal ring on 2-7 (mid-dorsally interrupted on 3-7) yellow; 8-10 pale (blue?), 9 with a longitudinal blackish stripe each side from base to three-fourths length; appendages a little shorter than 10, genital valvules hardly reaching beyond the tips of the appendages, but the “palps” of the valvules reach beyond them; no vulvar spine on 8; tarsal claws toothless; hind wings with 11 postcubitals, ultranodal sector arising at ninth post-cubital on all wings, upper sector of the triangle ending between the 8th and 9th, lower sector of triangle ending near level of 5th or 6th postcubital.

*Dimensions.*—Abdomen, ♂ 38.5, ♀ 34.5; hind wing, ♂ 21.5, ♀ 22.5 mm.

*Hab.* GUATEMALA, Livingston (*Williamson, coll. ejusd.*: 1 ♀); NICARAGUA, Escondido River, 50 miles from Blewfields (*C. W. Richmond, U. S. N. M.*: 1 ♂).

Mr. Williamson records that he took the female “in a room in town.”

### ISCHNURA (p. 122).

#### *Ischnura ramburi* (p. 124).

The statistics given on the next page appear to indicate a geographical variation in the number of postcubitals. These figures, although based on scanty data, indicate a tendency toward a greater number of postcubitals in both sexes at Amatitlan as compared with Belize, and in each locality a tendency for the females to possess a greater number of postcubitals than the males. This latter, sexual, difference has been alluded to (*antea*, p. 127, line 18). It will be noted also that the Amatitlan examples are slightly larger than those from Belize, which, taken in conjunction with the data given in the table (*antea*, p. 125), may indicate that, in the tropics, the size of *ramburi* increases with the altitude.

The distinction between “olive” and “orange” females is by no means a sharp one. Four olive females (Altamira, Belize, Amatitlan) and two orange females (Belize) have their pale postocular spots not confluent, or barely confluent, with the pale colour of the rear of the head (*cf.* key to females, 2, *antea*, p. 123).

*ramburi*, type form (p. 124).

To the localities given, add:—MEXICO, Altamira [*Hoag*: 4 ♂, 1 ol. ♀] in Tamaulipas, Ocotlan [*Calvert*: 1 pair + 2 or. ♀] and Chapala [*ibid.*: 1 bl. ♀, 2 ol. ♀] (*coll. P. P. C.*) in Jalisco; BRITISH HONDURAS, Belize [1 pair + 6 ♂, 1 or. ♀]; HONDURAS, Puerto Cortez [1 ♂, 1 or. ♀] (*Williamson, coll. ejusd.*).

Var. *credula* (p. 125).

*Ischnura ramburi*, var. *credula*, Baker, *Invert. Pacif. i.* p. 86 (1905)<sup>19</sup>.

To the localities given, add:—MEXICO, Guzman [*Calvert*: 4 ♂, 1 bl. ♀, 1 or. ♀] in Chihuahua, Altamira [*Hoag*: 1 ♂] in Tamaulipas, Ocotlan [*Calvert*: 1 bl. ♀] (*coll. P. P. C.*) in Jalisco; BRITISH HONDURAS, Belize [1 pair + 7 ♂, 2 bl. ♀, 7 or. ♀]; GUATEMALA, lake on railroad west of Guatemala City [2 ♂], Amatitlan [81 ♂, 12 bl. ♀, 17 or. ♀, 21 ol. ♀]; HONDURAS, Puerto Cortez [1 ♂, 2 ol. ♀] (*Williamson, Hine, colls. Wllmsn., O. S. U.*); NICARAGUA, Chinandega<sup>19</sup> (*Baker, coll. P. P. C.*: 1 ♂).

#### *Ischnura denticollis* (p. 126).

♀ (black or homöochromatic). The Ocotlan example has the pale postocular spots very small, the blue antehumeral stripe represented by a small inferior spot only. That from Toluca has the antehumeral stripe represented by a cuneiform blue spot at what would be the upper and lower ends respectively.





♀ (intermediate between black, or homœochromatic, and orange, or heterochromatic). A specimen from Ocotlan has the following characters of the black females: second antennal joint black, pale postocular spots not confluent with the pale colour of the rear of the head, pale antehumeral stripe narrow, interrupted near its upper end so as to have the form of an inverted !, and the following features of the orange females: nasus partly green, middle prothoracic lobe with a curved yellow stripe on each side, abdominal segments 8 and 9 black on dorsum. A female from Jalapa has the two following "black" characters: pale postocular spots not confluent with the pale colour of the rear of the head, pale antehumeral stripe complete but narrower than in orange females, but its other characters are those of the "orange" form. A female from Guadalupe, otherwise of the heterochromatic form, has the pale postocular spots not confluent with the pale colour of the rear of the head.

♀ (orange or heterochromatic). Of ten females taken pairing at Jalapa, Sept. 11, 1906, by myself, seven have abdominal segments 8 and 9 entirely black dorsally; the other three evidently had the dorsum of these segments blue with the black stripe each side, but the blue is darkening so as to approach the totally black condition, thus supporting the suggestion made (*antea*, page 127) that the totally black state is indicative of greater age.

A vulvar spine is absent in the great majority (32) of these supplementary females; the exceptions are four heterochromatic examples (Jalapa 2, Toluca 2) which have a spine or a rudiment of a spine.

The following comparison of examples of this species from Jalapa (4500 feet, 1370 metres) and from Toluca (8600 feet, 2625 metres) shows that the latter are slightly larger and have some tendency toward an increased number of postcubitals. The data from both localities lend some support to the statements made (*antea*, page 127) as to the greater number of postcubitals in the more southern Mexican examples as compared with those from the United States, and as to the tendency of the females toward a greater number of postcubitals than exists in the males.

	Length of abdomen in mm.		Length of hind wing in mm.		Percentage of wings having the following respective numbers of postcubitals:—										
	Range.	Average.	Range.	Average.	Front wings:					Hind wings:					
					11.	10.	9.	8.	7.	10.	9.	8.	7.	6.	
Toluca.															
{ 25 ♂♂ .....	18.5-22	20.6	13.5-15.5	14.5	16	56	26	2	..	2	24	64	8	2	
{ 15 het. ♀♀ .....	19-22	21.07	16-18	16.6	33.3	40	26.7	..	..	6.7	33.3	50	10	..	
Jalapa.															
{ 20 ♂♂ .....	18-20.5	19.6	12.5-15	13.6	..	45	45	7.5	2.5	..	15	67.5	17.5	..	
{ 12 het. ♀♀ .....	19-21.5	20.3	14.5-16	15.3	4.2	66.7	20.8	8.3	..	..	16.6	66.6	16.6	..	

To the localities given, add:—MEXICO, Guadalajara [*McClendon*; 1 ♂] and Ocotlan [3 ♂, 1 bl. ♀, 2 or. ♀] in Jalisco, Yurecuaro [1 or. ♀] in Michoacan, Toluca [30 ♂, 1 bl. ♀, 17 or. ♀] (*Calvert, coll. P. P. C.*), Gaudalupe (*Tower, coll. P. P. C.*: 3 or. ♀] in the Distrito Federal.

This species and *I. demorsa* were found at the same ditches at Yurecuaro and at Toluca.

**Ischnura demorsa** (p. 128).

♂. In the third line of the description, *antèa*, page 128, insert "of 8" after "base." A male from Nogales has the left inferior appendage trifold by reason of the normally superior branch being itself bifid.

♀ (intermediate between black and orange forms). An otherwise black ♀ from Yurecuaro has the posterior dorsal half of segment 8, the posterior two-thirds of 9, and a small median dorsal spot on 10, blue; on 8 and 9 the anterior margin of the blue is trilobed, the median lobe being more pointed and extending a little farther forward than the other two. Another female from the same locality, agreeing generally with the black form, has 8 and 9 coloured as just described, but the blue postocular spots are confluent with the pale colour of the rear of the head. A third ♀ from Yurecuaro has the postocular spots and the pale colour of the thorax orange, the postocular spots confluent with the pale colour of the rear of the head, the black humeral stripe a little wider than the pale antehumeral, segments 1 and 2 orange but the dark metallic-green dorsal markings are wider than described for orange females on page 129, line 2, *antèa*, 3-7 as in the black ♀, 8 with a small dorsal antepical trilobed blue spot, 9 blue with a pair of triangular dark spots at base.

Two other females from Yurecuaro are of the orange form, but they and the third female above described have no notch on the middle of the hind prothoracic margin.

A vulvar spine is lacking in almost all these supplementary females; the exceptions are an old female from Yurecuaro and one from Nogales, in which a small or very small spine is present.

To the localities given, add:—MEXICO, Nogales [3 ♂, 1 ♂] in Sonora, Saltillo [1 ♂, 1 ♀] in Coahuila, Yurecuaro [5 ♂, 2 bl. ♀, 3 or. ♀, 9 ♀] in Michoacan, Ocotlan [1 ♀] in Jalisco, Toluca [1 ♂, 1 ♀] (*Calvert, coll. P. P. C.*), Escuinapa (*Batty, A. M. N. H.*: 1 ♀) in Sinaloa, San Luis Potosi (*Hoag, coll. P. P. C.*: 4 ♂), Queretaro (*coll. Deam*: 1 bl. ♀).

## ANOMALAGRION (p. 130).

**Anomalagrion hastatum** (p. 130).

*Anomalagrion hastatum*, Needham, Bull. 68 N. Y. St. Mus. p. 262, t. 14. fig. *j*, t. 15. fig. *e*, t. 18. figg. 5, 6 (nymph and imago) (1903)<sup>12</sup>; Proc. U.S. Nat. Mus. xxvi. p. 709, fig. 4 *u* (1903)<sup>13</sup>.

To the localities given, add:—MEXICO, Altamira (*Hoag, coll. P. P. C.*: 1 transit. ♀) in Tamaulipas; BRITISH HONDURAS, Belize [2 ♂, 1 bl. ♀]; GUATEMALA, Puerto Barrios [1 bl. ♀], Los Amates [1 ♂], Amatitlan [1 bl. ♀]; HONDURAS, Puerto Cortez [8 ♂, 6 bl. ♀, 5 or. ♀] (*Williamson, Deam, coll. Wllmsn.*).

Mr. Williamson made the following notes on this species: "Los Amates, Jan. 17, 1905. ♂. In bog across river from Los Amates on trail to Dr. Johnson's." "Puerto Cortez, March 2, 1905. ♂. In *Pontederia* beds 20 feet from ocean" [hence associated with *Ceratura capreola*, q. v.].

I have now evidence which has convinced me that the "orange female" of this species is a younger stage of the "black female."

## CERATURA (p. 131).

**Ceratura capreola** (p. 131).

*Ceratura capreola*, Baker, Invert. Pacif. i. p. 86 (1905)<sup>9</sup>.

The variations in the colouring of abdominal segments 8 and 9 of the supplementary material are as follows:—

Locality and number of specimens examined (bl. = black, or. = orange, ♀♀).	Transverse apical blue on abd. seg. 8 of ♂♂		Abdominal segment 9 of ♀♀		
	interrupted.	not interrupted.	entirely pale (blue or orange).	blue with a pair of small basal black spots.	entirely black.
Belize, 4 ♂, 2 or. ♀ .....	4	....	2 or.	....	....
Puerto Barrios, 1 bl. ♀, 1 or. ♀ .....	....	....	1 or.	....	1 bl.
P. de San Felipe, 2 ♂, 1 or. ♀ .....	1	1	1 or.	....	....
Los Amates, 50 ♂, 17 bl. ♀, 33 or. ♀ ..	31	19	5 bl., 33 or.	1 bl.	11 bl.
Gualan, 1 ♂ .....	1	....	....	....	....
Amatitlan, 1 bl. ♀, 1 or. ♀ .....	....	....	....	....	1 bl., 1 or.
Puerto Cortez, 16 ♂, 4 bl. ♀, 3 or. ♀ ..	9	7	1 bl., 3 or.	2 bl.	1 bl.
Managua, 1 or. ♀ .....	....	....	1 or.	....	....
Surubres, 4 ♂ .....	4	....	....	....	....

The degree of interruption of the transverse apical blue on abdominal segment 8 of the males varies greatly, as in those from Los Amates, from a fine mid-dorsal black line to a mid-dorsal black band three-fourths as wide as the segment, or, in one example, the blue is broken by black into three spots.

Variation at one locality, Los Amates, is shown in the following table:—

	Length of abdomen in mm.		Length of hind wing in mm.		Percentages of wings having the respective numbers of postcubitals:—							
	Range.	Average.	Range.	Average.	Front wings:			Hind wings:				
					8.	7.	6.	7.	6.	5.	4.	
50 ♂♂ .....	16.5-19.5	18	9.5-11	10.3	2	58	40	1	20	77	2	
50 ♀♀ {	17 black ....	16.5-18.5	17.5	10.5-12	11.25	4	25	5	..	17	17	..
	33 orange ....	16-19	17.5	10.5-12	11.5	4	49	12	..	32	33	1
					8	74	17	..	49	50	1	

To the localities given, add:—BRITISH HONDURAS, Belize [4 ♂, 2 or. ♀]; GUATEMALA, Puerto Barrios [1 bl. ♀, 1 or. ♀], Puerto de San Felipe [2 ♂, 1 or. ♀], Los Amates [119 ♂, 17 bl. ♀, 33 or. ♀], Gualan [1 ♂], Amatitlan [1 bl. ♀, 1 or. ♀]; HONDURAS, Puerto Cortez [1 pair + 15 ♂, 3 bl. ♀, 3 or. ♀] (*Williamson, Miller, Deam, Hine colls. Wllmsn., O. S. U.*); NICARAGUA, Managua<sup>6</sup> (*Baker, coll. P. P. C.: 1 or. ♀*); COSTA RICA, Surubres near San Mateo (*Biolley, coll. Kahl: 4 ♂*).

Mr. E. B. Williamson noted of this species at Los Amates, Jan. 16, 1905:—"In bog

or swamps. Actions similar to [*Ischnura*] *verticalis*. Fresh ♀♀ thorax bright green"; and at Puerto Cortez, Mar. 2, 1905: "In *Pontederia* beds 20 feet from ocean." Prof. Biolley records this species at Surubres as from "Herbes d'une rigole."

PALÆMNEMA (p. 133).

**Palæmnema angelina** (p. 136).

Two females from Cacao, Alta Vera Paz, Guatemala (*Lewton, U. S. N. M.*) may belong here. One has abdomen 35 mm., hind wing 26.5 mm., postcubitals on the front wings 25, on the hind wings 24, 23. The other has abdomen 32.5 mm., hind wing 28.5 mm., postcubitals on the front wings 19, 18, on the hind wings 17, 18.

**Palæmnema** sp.

A male from Pozo Azul de Pirris, Costa Rica (*Underwood, M. C. Z.*), with 22, 23 postcubitals on the front wings, 21, 19 on the hind, stigma of the front wings surmounting 1+ cells, its costal edge .8-.9 mm. long, hind wing 22.5 mm. in length, is of the *angelina-nathalia-domina* group, but is not further determinable owing to the loss of the abdomen beyond the fifth segment.

NEONEURA (p. 137).

Three species of this genus are now known, or likely, to be present in this fauna, and may be separated as follows, in addition to the differences (figured) in the appendages of the males:—

	<i>N. amelia.</i>	<i>N. paya</i> (♀ unknown).	[ <i>N. aaroni.</i> ]
Dorsum of abdominal segments 2 and 3, ♂,	chiefly orange-red.	chiefly orange.	brown or black, 3 with a pale mid-dorsal line.
Dorsal surface of head and thorax, ♂,	bright orange-red.	pale ochre-brown.	pale brown (young) to bright brick-red.
Black mid-dorsal thoracic stripe, ♂,	present.	absent.	present (interrupted in young).
Black mesepimeral black stripe, ♂,	usually present.	absent.	present in old only.
Black line on second lateral thoracic suture, ♂ ♀,	uninterrupted for entire length of suture.	uninterrupted for entire length of suture.	absent, or if present very fine and interrupted.
A black dot at about two-thirds height of the obsolete first lateral thoracic suture, ♂ ♀,	present.	present.	absent, except in old males.
Hind margin of hind lobe of prothorax, ♀ (cf. Tab. X. figg. 26, 29),	trilobed, median lobe larger than the lateral lobes.	....	not trilobed, but median part convexly produced (= middle lobe of the other species).

In line 23, page 137, *antèa*, change "or" to "and" and "fauna" to "faunæ."

**Neoneura amelia** (p. 138). (Tab. X. figg. 25, 26.)

*Neoneura amelia*, Baker, Invert. Pacif. i. p. 86 (1905)<sup>1</sup>.

- ♂. The black mesepimeral stripe is reduced to an inferior spot in the males from Fuerte de San Felipe and Chinandega and in some from Los Amates, and is entirely absent (as in all females) in two from the last locality.
- ♀. (Previous description based on a single imperfect specimen.) Head and thorax pale brown, with the following black markings in addition to those described: two spots on each side of the vertex touching the eye-margin, the anterior spot connected with a black line which runs toward, but not to, the lateral ocellus and bends (a spot at the angle) toward the hind margin of the head, only a short transverse line on each side of the rear of the head superiorly. Abdomen greenish-yellow, 2-7 with an ill-defined black longitudinal line or stripe each side, not quite attaining either anterior or posterior end of each segment, in some absent on 6 or 7, the dorsal interval between the stripes more or less filled in with brown or black, each of the two ends of 3-7, however, often presenting the appearance of having a mid-dorsally interrupted yellowish ring, 8-10 obscure with darkish markings. Appendages subequal in length to 10. Genital valvules reaching to, or nearly to, the level of the tips of the appendages, their "palps" much farther. Legs pale yellowish, femora superiorly, and distal part of tibiae inferiorly, with a dark line. Postcubitals on hind wings 8-9, 8 predominating. Abdomen 23-25, hind wing 16.5-18 mm.\*

To the localities given, add:—GUATEMALA, Fuerte (or Puerto) San Felipe [1 ♂] on Lake Izabal, Los Amates [2 pairs + 23 ♂, 3 ♀] (*Williamson, Deam, Hine, colls. Willmsn., O. S. U.*); NICARAGUA, Chinandega<sup>1</sup> (*Baker, coll. P. P. C.: 1 ♂*).

Mr. Williamson made these two notes on this species at Los Amates on Feb. 16 and 18, 1905, respectively: "♂. Along stream below Los Amates on vegetation and twigs over water. Active." "♂. Very active, over water usually on dead twigs. ♂ holds ♀ while oviposition takes place. In couple ♀ hangs straight down from first segment [of] ♂."

**Neoneura paya**, sp. n. (Tab. X. figg. 27, 38.)

*Neonura amelia*, Calvert, *antea*, p. 138 (in part.; the 2 ♂ from Livingston mentioned in footnote).

- ♂. Dorsal surface of head and of thorax pale ochre-brown to orange, labium cream-colour; the following black, those enclosed in parentheses absent in some: a mid-basal and a lateral marginal spot on the labrum; two short streaks, fused into one in some, on each side of the nasus; apex of the third antennal joint and remainder of the antenna, two dots on each side of the vertex at the eye-margin, from the anterior of these dots a line toward, but not reaching, the lateral ocellus of the same side (and ending in a dot), the posterior dot confluent with the black of the rear of the head in some; (the mesial margin of each lateral ocellus,) a short transverse line behind the ocelli, rear of the head except for a yellow band along each eye-margin, two (or three) dots on the front prothoracic lobe, the median groove and two (or three) spots on each side of the middle prothoracic lobe, the transverse depression in front of the inferior fork of the mid-dorsal thoracic carina, a line on the humeral and on the second lateral thoracic suture, a dot on the site of the obsolete first lateral thoracic suture, about half-way from metastigma to superior metapleural margin (and a line above the dot). Sides of thorax behind the humeral suture paler, more yellowish.

Abdominal segments 1-3 orange, a dorsal basal spot on 1, an elongate spot on each side of 2, a stripe on each side of 3 for almost the entire length of the segment and meeting its fellow of the opposite side on the dorsal apical sixth, brown or blackish; 4-10 black or blackish, 4-7 or 8 with a narrow transverse basal ring and a mid-dorsal line, yellow; more than the posterior half of 10 pale brown in some, ventral

\* In addition to the supplementary material listed above, I have examined two pairs and 14 ♂ taken at Livingston, Guatemala, by Mr. Williamson.

surface of 1-7, or even 1-10, pale yellow except the sternites of all and the apex of 3-7, which are blackish. Hind margin of segment 10 denticulated and with a shallow median excision.

Superior abdominal appendages half, or less than half, as long as segment 10, bent downward and inward at a right angle as seen in most dried specimens, but when extended each appendage is more than half as long as 10, is bifid for two-thirds its own length, the upper and lower branches of subequal length and thickness (profile view), apices of the branches slightly curved toward each other, interval between the two branches subequal to or a little greater than the thickness of either branch; tip of lower branch ending in two small points or teeth. Inferior appendages slightly longer than the superiors, pale brown. Legs pale yellow, knees blackish, superior surface of first tibiae, two rather indistinct transverse fasciae on all of the femora, and in some also on each of the other tibiae, subfuscous; femora with an interrupted blackish superior stripe becoming continuous and darker with age.

Wings hyaline, 9-11 postcubitals (most frequently 10,  $66\frac{2}{3}\%$ ) on the front wings, 8-10 (most frequently 8, 50%) on the hind.

*Dimensions*.—Abdomen 26.5-27.5, hind wing 16-17 mm. ♀ unknown.

*Hab.* GUATEMALA, Puerto Barrios (*Hine, O. S. U.*: 8 ♂), Section 11, Ferrocarril del Norte (*Williamson, coll. ejusd.*: 1 ♂).

The specific name proposed is that of an Indian tribe.

[**Neoneura aaroni** (p. 139). (Tab. X. figg. 28, 29.)

The additional figures will make clearer one of the differences between this and the other two species.]

#### PROTONEURA (p. 140).

Two new species necessitate the following modifications of the Key on page 140:—

The clause "superior sector of the triangle ending a little beyond the cross-vein descending from the nodus" is to be taken out of the characters of division I. and made subdivision 1 of I., to include *peramans*, *cupida*, *amatoria*, sp. n., *aurantiaca*, and *cara*.

Change CC to CCC, and insert a new CC as follows:—

CC. Thoracic dorsum predominantly black, an orange antehumeral stripe, one-tenth to one-sixth as wide as the mid-dorsal black, reaching upward three-fifths' to three-fourths' way toward the base of the front wing (♂), or a yellow posthumeral line (♀), mid-dorsal thoracic carina orange or yellow; abdominal segments 3-6 of ♂ chiefly orange-red, black at apices and along sides; ♀ not distinguishable from that of *cupida* if the latter has been correctly identified . . . . . 2 A. *amatoria*.

(*Cupida* ♂ has the blue antehumeral stripe one-half to one-third as wide as the black mid-dorsal stripe and reaching upward to the front wing base, the mid-dorsal thoracic carina black, abdominal segments 3-6 black with a narrow transverse basal blue ring. *Aurantiaca* ♂ has the orange-yellow antehumeral stripe wider than the mid-dorsal black, reaching upward to the front wing base, mid-dorsal thoracic carina black, 3 chiefly orange, 4-6 black with a very narrow transverse basal pale ring.)

Between BB and II. insert subdivision 2 of I. as follows:—

2. Superior sector of the triangle ending at the cross-vein descending from the nodus; nodal sector on the hind wings arising nearest the fourth postcubital, thoracic dorsum chiefly pale blue (♂) or metallic green (♀),

abdomen violet-black or dark metallic-green with a very narrow transverse basal pale ring on segments 3-7; inferior appendages of ♂ two-and-a-half times as long as the superiors . . . . . 4 A. *corculum*.

**Protoneura peramans** (p. 141).

A supplementary pair from Alta Vera Paz present the following venational variations:—the nodal sector on both hind wings of the male and on one hind wing of the female arises nearest the sixth postcubital; on one front wing of the male the superior sector of the triangle reaches to the cross-vein next distal to that descending from the nodus.

To the localities given, add:—GUATEMALA, Cacao in Alta Vera Paz (*Barber, U. S. N. M.*: 1 pair).

**Protoneura cupida** (p. 142).

To the localities given, add:—GUATEMALA, Section 11, Ferrocarril del Norte (*Williamson, coll. ejusd.*: 1 ♂).

2 (A). **Protoneura amatoria**, sp. n. (Tab. X. figg. 49-52.)

♂. Head and dorsal surface of thorax black, with some metallic-green or violet reflections, labium cream-coloured; the following *yellow, yellowish-green, or pale blue*: anterior margin of labrum, some dots on the rhinarium, genæ, an oblique line on each side of the anterior surface of the frons and confluent with the gena of the same side, first antennal joint anteriorly, apex of second joint; the following *orange*: a small spot on each side of, and in some also a larger mid-dorsal spot on, the front prothoracic lobe, a pair of larger dorsal spots separated from each other only by a median black line and the sides inferiorly on the middle prothoracic lobe, in some a median dot on the hind prothoracic lobe, mid-dorsal thoracic carina, an antehumeral (mesepisternal) stripe reaching from the anterior mesothoracic margin three-fifths' to three-fourths' way to base of front wing and one-fifth to one-third as wide as the black between it and the mid-dorsal carina, a spot immediately in front of the antealar sinus, antealar sinus itself, a mesepimeral stripe, which borders the humeral suture posteriorly and reaches up to the front wing-base, but not as far forward as the antehumeral stripe extends and to which stripe it is subequal in width or a little narrower; (at its lower or anterior end the mesepimeral stripe is confluent with the antehumeral for hardly more than a point, elsewhere the black which separates them is subequal in width to the mesepimeral stripe). Metepisternum and metepimeron yellow, the latter becoming paler inferiorly, perhaps even, with the metasternum, a pale blue in life; a black stripe, wider superiorly, on the second lateral thoracic suture, and a black dot behind the upper part of this stripe.

Hind margin of prothorax convex, entire.

Abdominal segment 1 black above, most of the sides and the ventral surface yellow. Dorsum of 2-7 orange, with the following black: a transverse ring at the articulations, a longitudinal lateral stripe as long as each segment and rising on the dorsum before the apex of 3-7, usually not meeting its fellow of the opposite side on 3 and 4, but on 5-7 meeting its fellow and thereby rendering the posterior dorsal thirteenth (5) to fourth (7) of those segments black; 2-7 with some yellowish ventrally, but their sternites black; 8-10 black dorsally, a pair of dorsal spots in the basal half and the sides inferiorly of 8, a transverse lateral spot confluent below with an inferior band and the sternite of 9, occasionally a pair of small spots on 10, orange.

Abdominal appendages black, superiors half to two-thirds as long as segment 10, excavated superiorly and interiorly before the apex, which is obtuse and rounded, an internal basal tubercle, an elongated pale infero-internal apical tubercle whose apex is distinct from that of the appendage proper in a latero-ventral view but not always in profile view. Inferiors slightly longer, slender, inclined somewhat toward each other, at three-fourths' length with a supero-internal tooth, which appears less obtusely-pointed in profile than in vertical view, as also does the apex of each appendage itself.

Legs pale yellowish; tarsi, most of the first tibiæ, distal third of the other tibiæ and of all the femora, blackish; at the proximal third of the femora and of the second and third tibiæ is a transverse pale brownish fascia.

♀. Differs from the ♂ as follows: a variable extent of yellow on the external surface of the mandible, in some a pale anterior line for the whole length of the second antennal joint, thoracic markings yellow instead of orange, dorsal spots of middle thoracic lobe entirely absent, or represented only by a lateral posterior yellow dot each side, or by these and a pair of median yellow dots, hind prothoracic lobe with a median and on each side a single yellow dot, antehumeral stripe present only for the lowest or most anterior third to fourth of the humeral suture and narrower than in the ♂, as is also the mesepimeral stripe, which in some is slightly interrupted just below its upper end, no transverse spot in front of the antealar sinus, which itself may be black, black stripe on the second lateral thoracic suture confluent superiorly with the black of the mesepimeron, dorsum of abdominal segments 2-10 black, 3-7 with a narrow, transverse, basal, mid-dorsally interrupted, yellow ring, confluent in some with the inferior lateral yellow which extends from 1-9 except where interrupted at the articulations.

Abdominal appendages half as long as segment 10, straight, conical, black. Genital valvules hardly attaining the level of the tips of the appendages, but their "palps" extend beyond that level. Anterior mesothoracic margin with a slender acute process behind each mesostigmal lamina, directed forwards, its tip curved slightly downward.

♂ ♀. Wings hyaline, arculus distinctly beyond the second antecubital; nodal sector arising nearest the fifth postcubital on the front wings, nearest the fourth on the hind; ultra-nodal sector beginning 2-3 cells proximal to the inner brace-vein of the stigma on the front wings, 1-2 on the hind; superior sector of the triangle ending in the cell distal to the cross-vein descending from the nodus; postcubitals on the front wings 10-12, most frequently 10, on the hind wings 10-7, most frequently 9.

*Dimensions.*—Abdomen, ♂ 31.5-35.5, ♀ 28.5-32; hind wing, ♂ 17.5-19.5, ♀ 19-20.5 mm.

*Hab.* GUATEMALA, Puerto Barrios (*Hine, O. S. U.*: 3 pairs + 2 ♂); HONDURAS, San Pedro Sula (*Williamson, coll. ejusd.*: 51 ♂, 34 ♀).

Mr. Williamson made the following notes on this species at San Pedro, in 1905:—"Feb. 27, ♂. In gulch, on dead twigs over water or on vegetation high above water; floats or drifts through air." "Feb. 27, ♀. In gulch." "Feb. 28, ♀. ♂ fills seminal vesicle after capturing ♀; ♀ oviposits, attended by ♂, in floating woody twigs, usually at broken ends of twigs; ♂ stands upright—neither submerged. Many pairs congregate about same litter as do some *Argias* and *Enallagmas* in States. In ovipositing, ♀ brings apex of abdomen directly under thorax."

### **Protoneura aurantiaca** (p. 143).

The description of the superior appendages of the male, *antea*, page 143, should read: "which is not recurved toward the other [*sc.* superior] appendage."

#### 4 (A). **Protoneura corculum**, sp. n. (Tab. X. figg. 41-44.)

♂. Eyes in the dried specimens bright red above, greenish or ochreous below. Most of the head and prothorax dark metallic green, but with some coppery and bronze reflections; labium cream-coloured, anterior edge of labrum orange, the following pale (blue?): rhinarium, genæ, a transverse frontal band confluent with them, first antennal joint anteriorly, apex of second antennal joint, a spot on each side of fore prothoracic lobe.

Thorax (exclusive of prothorax) mostly pale blue, a narrow mid-dorsal black stripe widening very gradually from its upper to its lower end, narrowly confluent at each end with metallic violet- or green-black which covers all of the mesepimeron and the anterior part of the metepisternum and reaches backward to the upper end of the second lateral thoracic suture. Each antehumeral pale blue area, at mid-height,



is two-and-one-half to three times as wide as the mid-dorsal black stripe and subequal in width to the mesepimeral violet- or green-black at the same level. This latter violet- or green-black does not attain the metastigma, but near the upper end of the site of the obsolete first lateral thoracic suture it encloses a pale spot, and it is confluent with a fine black line on the second lateral suture. Most of the metepisternum pale yellow in one specimen.

Abdomen violet-black dorsally, sides and lower surface of segments 1-8 or 10 mostly yellow, confluent with a very narrow, transverse, basal, mid-dorsally interrupted, yellow ring on 3-7, posterior margins of 7-9 narrowly pale, 9 with a transverse orange stripe each side. Hind margin of 10 with a mid-dorsal notch. Superior abdominal appendages slightly shorter than segment 10. Inferiors about  $2\frac{1}{2}$  times as long as the superiors, in profile view higher in their basal third, curved somewhat toward each other in their distal two-thirds.

Legs pale brownish-yellow, distal halves of the femora superiorly and much of the first tibiæ inferiorly, blackish.

Hind margin of prothorax convex, entire.

♀. Differs from the ♂ as follows:—Eyes above greenish, perhaps with some lilac; labrum mostly orange, metallic blue at base; nasus metallic blue, pale colours of the face of the ♂ here yellow, each side of the middle prothoracic lobe with a pale stripe and inferior margin pale, thoracic dorsum metallic green, a yellow line on the humeral suture; pale spot enclosed by the mesepimeral metallic green, near the upper end of the obsolete first lateral suture, reduced to a line; violet-black of abdominal dorsum passing into metallic green anteriorly; abdominal appendages slightly shorter than segment 10, conical, simple, apices of the genital valvules reaching to the level of the hind margin of 10, of the "palps" to beyond the level of the tips of the appendages; a mesostigmal lamina each side, produced into an external superior angle.

♂ ♀. Wings clear, arculus distal to the second antecubital by more than the length of its own upper limb; postcubitals, front wings 9-10, hind wings 8.

*Dimensions*.—Abdomen, ♂ 28-29.5, ♀ 27; hind wing, ♂ 15.5-16, ♀ 18 mm.

*Hab.* GUATEMALA, Livingston (*Williamson, coll. ejusd.*: 2 ♂, 1 ♀).

Mr. Williamson noted of this species, Feb. 18, 1905:—"2 ♂ and 1 ♀ taken. Abdomen enlarged apically, especially in ♀, beginning about middle of segment 6. Rare among mangroves along stream, emptying into first lagoon of Rio Dulce. Only four or five seen. Not as alert as species with dorsum of thorax red [= *Neoneura amelia*] with which it was associated."

This species belongs to that group of *Protoneura* formed by de Selys (1886) for *P. paucinervis*, Selys, and *P. exigua* (Bates MS.), Selys, of the Amazon. From the male of *paucinervis*, the male differs by the yellow enclosed within the mesepimeral black *not* confluent with the pale antehumeral area, by the absence of yellow spots on abdominal segments 2 and 3, and possibly also in the abdominal appendages. *P. exigua* is a larger species than *P. corculum* and has the prothorax orange, no mesepimeral black, abdominal segments 9 and 10 pale, the inferior appendages of the male shorter than the superiors, &c.

***Protoneura remissa*** (p. 144). (Tab. X. fig. 45.)

To the localities given, add:—GUATEMALA, Los Amates [*Deam*: 1 ♂]; HONDURAS, San Pedro Sula (*Wllmsn.*: 2 ♂] (*coll. Wllmsn.*).

Mr. Williamson made these notes on this species at San Pedro Sula:—"Feb. 26, 1905. On leaf of shrub over dark ravine during rain-storm." "Feb. 27, 1905. In gulch, about vegetation, drifts or floats in flight."

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3f

## PROGOMPHUS (p. 148).

**Progomphus obscurus borealis** (p. 151).

Page 151, line 18, for "thoracic carina" read "thoracic suture."

To the localities given, add:—MEXICO, Baños de Santa Rosalia (*Calvert, coll. P. P. C.*: 3 ♂) in Chihuahua.

This species and *Erpetogomphus crotalinus* were found on sand- or mud-banks, hardly above water-level, along the sides of an irrigating ditch into which the water from the baths of Santa Rosalia empties. On alighting on these banks, *P. obscurus borealis* held its abdomen slanting upward to form an angle of 45°–60° with the bank, while *E. crotalinus* held it nearly horizontal.

## GOMPHOIDES (p. 152).

**Gomphoides volsella** (p. 156). (Tab. X. fig. 48.)

The new figure is to replace that of Tab. VII. fig. 14.

**Gomphoides ambigua** (p. 157).

The two males from San Felipe, Guatemala, listed *antèd*, page 157, were received as the final proof was passing through my hands, when it was not convenient to add certain notes on them which here follow. They have the dilated margin of abdominal segment 9 much narrower (.25 mm.), the pale stripes on the thorax wider (*e. g.*, maximum width of first antehumeral stripe .8–.9 mm., of mesepimeral stripe 1.2 mm.), and the pterostigma shorter (its costal edge on front wings 4.5 mm.) than in the Mexican examples, the corresponding dimensions in most of which are 1, .3–.5, .5–.9, and 5 mm. However, isolated instances occur among the Mexican material which approach the conditions found in these two Guatemalan males. Thus a teneral male from Guadalajara has the pterostigma 4.5 mm., although the dilated margin of segment 9 is 1 mm. wide. Another Guadalajara male has this dilated margin .6 mm. wide, although in other respects agreeing with the Mexican specimens. The male from Altamira has the first pale antehumeral stripe as wide as in those from San Felipe, but is otherwise like its compatriots.

## ERPETOGOMPHUS (p. 159).

The most southern locality for this genus certainly known is now San José in Costa Rica, as cited below under *E. elaps*.

**Erpetogomphus elaps** (p. 163). (Tab. X. figg. 30–34.)

To the localities given, add:—COSTA RICA, San José (*Biolley*: 1 ♂).

This additional male has directed my attention to the considerable variation in the first hamule of males of this species from various localities, illustrated in our figures. I do not find any other feature varying correlatively.

**Erpetogomphus cophias** (p. 164). (Tab. X. fig. 47.)

The new figure is to replace that of Tab. VII. fig. 33.

**Erpetogomphus crotalinus** (p. 165).

To the localities given, add:—MEXICO, Baños de Santa Rosalia (*Calvert, coll. P. P. C.*: 1 ♂) in Chihuahua, Las Bocas (*Batty, A. M. N. H.*: 1 ♂, 1 ♀) in Durango.

For a note on a habit of this species as observed at Santa Rosalia, see under *Progomphus obscurus borealis*, *antea*, page 398.

**Erpetogomphus boa** (p. 165). (Tab. X. figg. 53, 54.)

Thanks to the kindness of MM. Martin and Severin, I have received two drawings of the abdominal appendages of the Selysian male type, copies of which form figures 53 & 54 of Tab. X. A note accompanying this drawing runs: "Les appendices supérieurs sont cassés." *E. boa*, in the light of these figures and the descriptions, seems hardly different from *E. elaps*, and apparently does not belong under AA of the synopsis, *antea*, page 160.

**Erpetogomphus sipedon** (p. 165).

A female in bad condition from Las Bocas in Durango, Mexico (*Batty, A. M. N. H.*), seems to be an immature example of form *a*.

**Erpetogomphus designatus** (p. 166).

An additional male, from San Pedro, has the dark antehumeral stripe reaching downward to the suture which separates the mesinfraepisternum from the mesepisternum (in the other specimens cited this stripe does not reach as far down as this suture), and more distinct and darker markings on abdominal segments 7–10 than have been described previously, viz., 7 with a black spot each side in its posterior half; 8 with a black stripe each side for almost its whole length, each stripe a little wider in its posterior half than the mid-dorsal pale area which separates it from its fellow of the opposite side; 9 and 10 each with a blackish-brown spot in the basal dorsal half, for the full width of 10 where it is bilobed posteriorly, not quite as wide as 9 where its two posterior lateral angles are prolonged backward and diverge from each other. In all other respects this specimen seems to be *designatus*; the differences may be due to age.

To the localities given, add:—MEXICO, San Pedro (*Calvert, coll. P. P. C.*: 1 ♂) in Coahuila.

## EPIGOMPHUS (p. 169).

**Epigomphus subobtusus** (p. 172).

To the localities given, add:—GUATEMALA, Cacao (*Barber, U. S. N. M.*: 2 ♂) in Alta Vera Paz; COSTA RICA, Tuis (*Lankester, A. N. S.*: 1 ♂).

## ANAX (p. 175).

**Anax junius** (p. 177).

To the localities given, add:—MEXICO, Baños de Santa Rosalia (*Calvert, coll. P. P. C.*: 1 ♂) in Chihuahua, San Pedro (*Calvert observ.*) in Coahuila.

**ÆSHNA** (p. 179).**Æshna cornigera** (p. 182).

An additional example, from Aguascalientes, has the green antehumeral stripe 1.0 mm. wide, the mesepimeral 1.5 mm., the metepimeral 1 mm., the last two not emarginate or indented on their anterior edges and only to a slight degree (at most to one-fifth of the width) on the hind edge of the mesepimeral stripe near its upper end. The Rio Janeiro male cited *antèa*, page 182, has the antehumeral stripe 1 mm. wide; mesepimeral stripe 1.7 mm. wide, indented on its anterior edge, at about mid-height, to a depth equal to two-thirds of its width, while on its posterior edge, just below its upper end, is an indentation whose depth is one-third of the width of the stripe; the metepimeral stripe is 1.5 mm. wide, indented on its anterior edge at mid-height to a depth equal to three-fourths of the width of the stripe, and above this, on the same edge, is another and much shallower indentation. Examples with such wide and deeply-indented lateral thoracic stripes present a great difference in appearance from those from Aguascalientes and Colombia (this latter has these stripes nearly as in that from Aguascalientes) and from the still narrower-banded examples, such as those from Atoyac. I have not been able to find any accompanying differences in the genitalia of the second abdominal segment.

To the localities given, add:—MEXICO, Aguascalientes City (*Calvert, coll. P. P. C.*: 1 ♂), San Marcos (*Goldsmith, M. C. Z.*: 3 ♂, 1 ♀) in Jalisco.

**Æshna multicolor** (p. 183).

The male from Toluca has the rounded inferior tubercle of the superior appendages at one-fourth their length (cf. *antèa*, page 180) and the pale stripes on the sides of the thorax about .7 mm. wide. The Aguascalientes male has these stripes 1 mm. wide. I cannot find any differences in the genitalia of the second abdominal segment of these two examples, nor in those of a narrow-striped male from Amula and a wide-striped male from Beulah, New Mexico. In general, and this applies to what has been said *antèa*, page 183, wide thoracic stripes are associated with larger pale spots on the abdomen and *vice versâ*.

To the localities given, add:—MEXICO, Aguascalientes City [1 ♂], Toluca [1 ♂] (*Calvert, coll. P. P. C.*).

The examples of *Æ. multicolor* and of *Æ. cornigera* from Aguascalientes were taken at the filthy pond on the east side of the railroad tracks, behind the public bath-house. At Toluca, on Sept. 19, 1906, *multicolor* was abundant but wary.

**Æshna luteipennis** (p. 186).

Males from Chapala and Costa Rica compared with that cited *antèa*, page 187, from Canta Gallo, Brazil, showed no differences in the genitalia of the second abdominal segment.

To the localities given, add:—MEXICO, Ocotlan and Chapala (*Calvert, coll. P. P. C.*: 5 ♂) in Jalisco; COSTA RICA, San José (*Biolley*: 1 ♂), Juan Viñas (*Cary, U. S. N.M.*: 1 ♂).

This handsome species was very abundant around Lake Chapala and in the town of Chapala, particularly in some streets, between 5 and 6 P.M., on Aug. 30, 1906, when they were hunting gnats; four of the five specimens taken were caught in the streets.

**GYNACANTHA** (p. 189).**Gynacantha tibiata** (p. 194). (Tab. X. fig. 17.)

The new figure is to replace that of Tab. VIII. fig. 24 *b*.

*LIBELLULINÆ* (p. 198).

Page 201, third line, insert "(except in *Dythemis maya*)" after "genital hamule not branched."

## PLATHEMIS (p. 205).

**Plathemis subornata** (p. 205).

*Plathemis subornata*, Williamson, Ent. News, xvii. p. 351, figg. (ventral plate of abd. seg. 1, ♂) (1906) 7.

To the localities given, add:—MEXICO, Guzman (*Calvert, coll. P. P. C.*: 1 ♂) in Chihuahua.

Four or five males and one female of this species were seen near the Laguna de Guzman, often settling on sandy or muddy banks of a small stream (outlet of a spring into the lake). They were not easily approached and only the one male was taken.

## LIBELLULA (p. 206).

**Libellula saturata** (p. 210).

Page 210, lines 24 and 30, for "genital hamule" read "genital lobe."

Subspecies *saturata* type.

The examples from Santa Rosalia have the submedian space, supertriangle and triangle of the hind wings not darker than the surrounding parts.

To the localities given, add:—MEXICO, Nogales (*Calvert observ.*) in Sonora, Chihuahua City (*ibid.*), Baños de Santa Rosalia [2 ♂, 1 ♀] in Chihuahua, Saltillo [1 ♂] (*Calvert, coll. P. P. C.*) in Coahuila, Las Bocas (*Batty, A. M. N. H.*: 5 ♂, 1 ♀) in Durango.

Three examples were seen at Nogales; their flight was very swift and they did not alight. The Saltillo male was taken in a cornfield situated on the high banks of the river.

**Libellula luctuosa** (p. 213).

To the localities given, add:—MEXICO, Baños de Santa Rosalia (*Calvert, coll. P. P. C.*: 1 ♂) in Chihuahua.

7. **Libellula comanche.**

*Libellula comanche*, Calvert, Ent. News, xviii. p. 201 (1907) 1.

*Libellula flavida*, Hagen (nec Rambur), Syn. Neur. N. Amer. p. 156 (1861) 2; Rep. U.S. Geol. Surv. Terr. 1872 (Hayden's), p. 728 (1873) 3; *ibid.* 1873, p. 587 (1874) 4; Proc. Bost. Soc. Nat. Hist. xviii. p. 71 (1875) 5.

*Hab.* UNITED STATES, Montana 4, Yellowstone 3 4, Ontario 1 [*Snodgrass*: 1 ♂] in California, Dallas 4, Waco 4, Round Mt. 1 [*Schaupp*: 4 ♂, 4 ♀] and Pecos River 2 in Texas.—MEXICO, Baños de Santa Rosalia 1 [*Calvert*: 2 ♂] (*colls. A. N. S., P. P. C.*) in Chihuahua.

This species, which would fall under B in our Key, *antèd*, page 206, may be recognized by the cream-yellow frons, yellow ( $\sigma$ ) or yellow to orange ( $\varphi$ ) labrum, ochraceous colouring at base of wings not reaching distad as far as the first antecubital and submedian cross-vein; pterostigma with proximal two-thirds cream-yellow ( $\sigma$ ), proximal half ochraceous ( $\varphi$ ), remainder ( $\sigma$   $\varphi$ ) blackish-brown; brown at apex of wings of female reaching proximad 1.5 mm. or half-way to distal end of stigma; two rows of cells between short sector and supplementary sector next below on hind wings. Abdomen,  $\sigma$  32-36,  $\varphi$  31-34; hind wing,  $\sigma$  37-42.5,  $\varphi$  40-41 mm.

#### URACIS (p. 217).

##### **Uracis imbuta** (p. 218).

*Uracis* sp.?, Needham, Proc. U.S. Nat. Mus. xxvi. t. 50. fig. 2 (venation) (1903).

To the localities given, add:—GUATEMALA, Cacao (*Barber, U. S. N. M.*: 1  $\varphi$ ) in Alta Vera Paz; COSTA RICA, Jesus Maria [2  $\sigma$ , 1  $\varphi$ ], Rio Machuca [1  $\sigma$ , 1  $\varphi$ ] (*Biolley, colls. A. N. S., Wllmsn.*).

##### **Uracis fastigiata** (p. 219).

To the localities given, add:—COSTA RICA, Surubres (*Biolley, A. N. S.*: 1  $\sigma$ ).

#### MICRATHYRIA (p. 220).

##### **Micrathyria didyma** (p. 223).

To the localities given, add:—COSTA RICA, Jesus Maria (*Biolley, A. N. S.*: 1  $\sigma$ ).

##### **Micrathyria hagenii** (p. 225).

To the localities given, add:—HONDURAS, San Pedro Sula (*Williamson, coll. ejusd.*: 1  $\varphi$ ); COSTA RICA, Punta Arenas (*Biolley, A. N. S.*: 1  $\varphi$ ).

Mr. Williamson noted that his example was taken "At mouth of gulch, Feb. 27, 1905."

##### **Micrathyria schumanni** (p. 227).

To the localities given, add:—COSTA RICA, Punta Arenas (*Biolley, colls. A. N. S., Wllmsn.*: 1  $\sigma$ , 5  $\varphi$ ).

##### **Micrathyria æqualis** (p. 228).

To the localities given, add:—HONDURAS, San Pedro Sula (*Williamson, coll. ejusd.*: 1  $\sigma$ , 1  $\varphi$ ).

**Micrathyria eximia** (p. 230).

I have examined two additional males from Puerto Barrios, Guatemala (*Deam, coll. Wllmsn.*).

## ORTHEMIS (p. 231).

**Orthemis ferruginea** (p. 234).

To the localities given, add:—MEXICO, Nogales and Hermosillo in Sonora, Guzman and Baños de Santa Rosalia in Chihuahua, Torreon and San Pedro in Coahuila, Aguascalientes City (*Calvert observ.*), Tepic, Ciudad [*Goldsmith: 1 ♂*], San Marcos [*Goldsmith: 4 ♂, 1 ♀*] in Jalisco, Chichen Itza [*Cole: 2 ♂, 1 ♀*] (*M. C. Z.*) in Yucatan.

At Hermosillo, August 11, 1906, this was the only species of Odonata I could find; several individuals were flying over the irrigated part of the plaza in front of the Cathedral. At Guzman, Aug. 7, this species was very active and wary.

**Orthemis biolleyi** (p. 237).

To the localities given, add:—COSTA RICA, Rio Machuca (*Biolley, A. N. S.: 1 ♂*).

## CANNAPHILA (p. 239).

**Cannaphila angustipennis** (p. 241).

To the localities given under *a*, p. 241, add:—COSTA RICA, Pozo Azul de Pirris (*Underwood, M. C. Z.: 1 ♂*).

Page 242, line 24, for "The following species" read "The following specimens."

To the localities given under *b*, p. 242, add:—COSTA RICA, Juan Viñas (*Merritt Cary, U. S. N. M.: 1 ♂, 2 ♀*).

## ANATYA (p. 244).

**Anatya normalis** (p. 245).

To the localities given, add:—HONDURAS, San Pedro Sula (*Williamson, coll. ejusd.: 1 ♀*).

This example was taken "in gulch on dead twig."

## ERYTHRODIPLAX (p. 246).

**Erythrodiplax funerea** (p. 249).

To the localities given, add:—MEXICO, Colima City (*Goldsmith, M. C. Z.: 1 ♀*); COSTA RICA, Juan Viñas (*Cary, U. S. N. M.: 1 ♀ b*), Surubres (*Biolley, coll. A. N. S.: 1 ♂, 1 ♀, 1 ♀ b*).

**Erythodiplax umbrata** (p. 251).

To the localities given, add :—COSTA RICA, Punta Arenas (*Biolley, colls. A. N. S., Wllmsn.* : 4 ♂, 3 ♀ *b*).

**Erythrodiplax ochracea** (p. 255).

To the localities given, add :—COSTA RICA, Jesus Maria [1 ♀], Punta Arenas [1 ♂, 1 ♀] (*Biolley, coll. A. N. S.*).

**Erythrodiplax connata** (p. 259).

Intermediate between **b** and **c** (p. 260).

To the localities given, add :—COSTA RICA, Juan Viñas (*Cary, U. S. N. M.* : 1 ♂).

**d** (p. 260).

To the localities given, add :—HONDURAS, Puerto Cortez [*Williamson* : 1 ♂], near San Pedro Sula [*L. A. Williamson* : 1 ♂] (*coll. Wllmsn.*).

Intermediate between **d** and **e** (p. 261).

To the localities given, add :—HONDURAS, near San Pedro Sula (*L. A. Williamson, coll. Wllmsn.* : 2 ♂).

**e** (p. 261).

To the localities given, add :—COSTA RICA, Surubres near San Mateo (*Biolley, colls. A. N. S. & Wllmsn.* : 2 ♂).

**b'** (p. 264).

To the localities given, add :—MEXICO, Baños de Santa Rosalia (*Calvert, coll. P. P. C.* : 1 ♂) in Chihuahua.

Intermediate between **b'** and **c'** (p. 264).

*Hab.* MEXICO, Baños de Santa Rosalia (*ibid.* : 1 ♂).

**c'** (p. 264).

The two following males have abdominal segments 2-7 of subequal width, 8-10 successively narrower, abd. 20-20.5, hind wing 22-24 mm.

To the localities given, add :—MEXICO, Baños de Santa Rosalia (*ibid.* : 2 ♂).

Intermediate between **c'** and **d'** (p. 266).

To the localities given, add :—MEXICO, Baños de Santa Rosalia (*ibid.* : 1 ♂), Yurecuaro in Michoacan (*ibid.* : 1 ♂).

**d'** (p. 266).

One of these males, a teneral individual, referred here on account of the extent of the colouring at the bases of the wings, has the face, including the frons, greenish-yellow.